
European projects update

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Outline

1. ***This!*** final year planning meeting
(BBC, London, feb03)
2. **Future PDA project discussion**
(Sheffield Univ., feb04)
3. ***RESPITE*** kickoff meeting
(ICP, Grenoble, feb07-08)



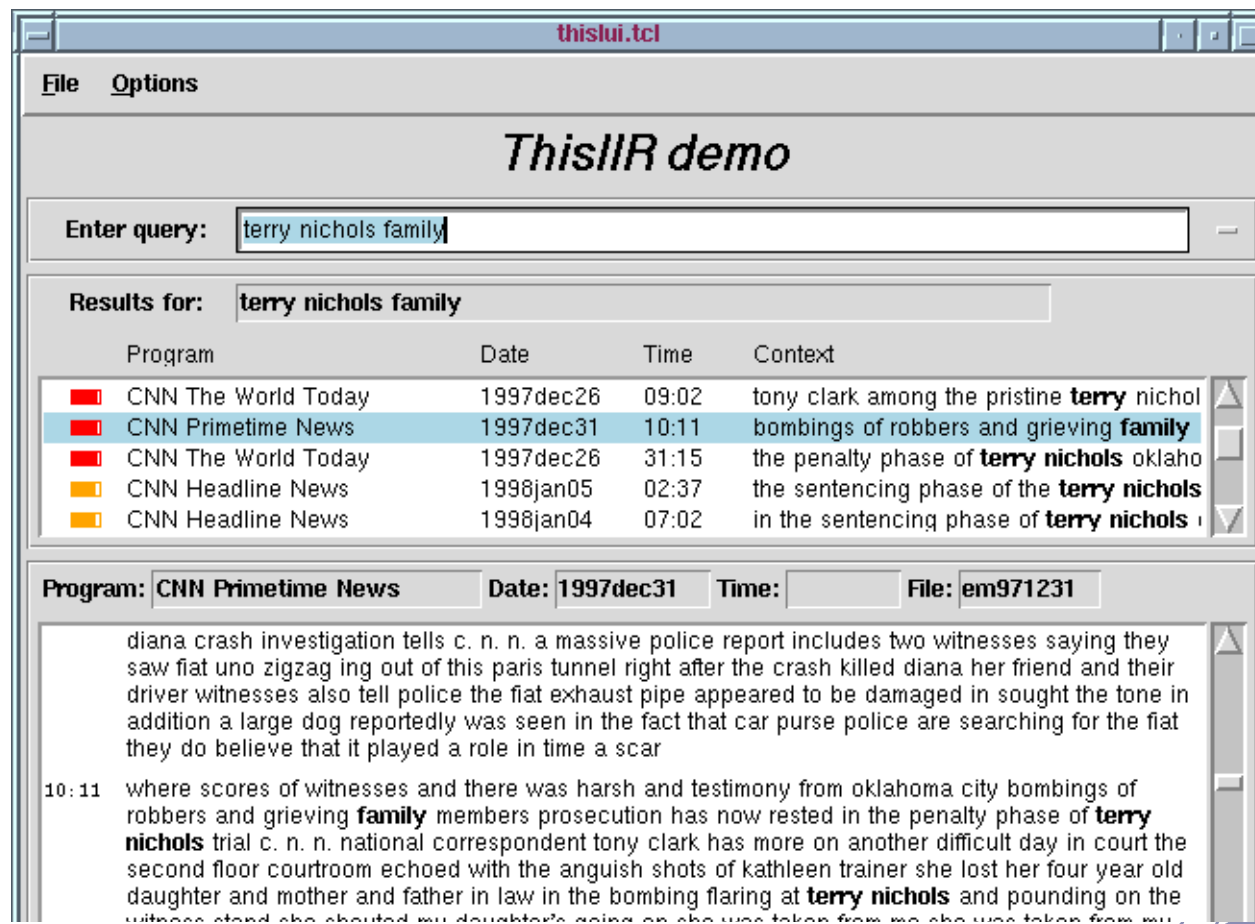
This! final year planning meeting

- **This! project:**
Using ASR (&c) to index BBC news archives
- **ESCA workshop on Spoken Document Retrieval (SDR) - April, Cambridge**
 - systems, IR/IE
 - demos, including this!IR
- **Current actions:**
 - finalize UKEng system to run on 1000hr archive (to demo in April)
 - ICSI to train MLP on BBC data (50hr)
 - segmentation? speaker tracking?
- **Other highlights:**
 - Latent Semantic Analysis with Self-Organizing Maps for SDR (Mikko Kurimo/IDIAP)
 - Confidence-based embedded training (Tony)



This! demo

- Stand-alone Tcl/Tk implementation
 - doesn't require httpd
 - speech-input ready



PDA proposal discussion

- **New EU 'Future & Emerging Tech' funding program (Framework 5)**
 - meeting to plan a possible project proposal
- **Partners interested in speech-centered PDA:**
 - Roger Tucker (HP Labs): audio info appliances
 - Tony Robinson (Cambridge): ASR, systems
 - Steve Renals (Sheffield): information access (IA)
 - IDIAP: multi-modal, Hervé's 'encapsulators'
 - FPMs: synthesis
 - ICSI: robust SR, UI/apps
- **HP vision**
 - 'fat pen' with mic & small display
 - dictaphone meets PDA
 - docks to PC
 - use pen-motion info?
 - access: skimming, summary, keyword search...



SpeechPDA proposal (cont'd)

- **Current application definition**
 - palm-style machine, docks, mixed online/offline
 - ASR for search, control, form-filling, summaries
 - voice notes/dictation as primary focus;
'ambient' recording as parallel track (shares IA)
- **Work packets**
 - ASR: wordspotting / robustness / efficiency
 - Info access: browse / skim / structure / SDR
 - System integration & user interface
 - ? other modalities (stylus, video?)
 - Evaluation: components / integrated system
- **Other observations**
 - meeting recorder doesn't have to be palm-size
(hierarchy of size/power trade-offs?)
 - using ASR (IA) independent of where it's done
 - OK to have algorithms without a real prototype



RESPITE kickoff meeting

- **REcognition of Speech by Partial Information TEchniques**
 - Auditory scene analysis etc. to find information
 - Multistream & missing-data to exploit it
 - new 3yr EU-funded project:
Sheffield, IDIAP, FPMs, ICP Grenoble, ICSI,
DaimlerChrysler, Matra
- **Rationalize work at partner labs:**
 - missing-data at SU, IDIAP, FPMs
 - multi-stream at IDIAP, ICSI, ICP
- **Baseline task:**
 - “Aurora” Distributed Speech Recognition task:
TIDIGITS corrupted in various ways
 - HTK and/or comparable system configuration
- **CASA toolkit**
 - practical information for use in ASR



Issues in missing data (Sheff/IDIAP)

- **Input features tagged as present/missing**
 - e.g. by subband SNR, scene analysis
- **Classic: 'Class imputation'**
 - integrate over missing data dimensions to evaluate output likelihoods:
$$p(X|q) = \int p(X_{\text{present}}, X_{\text{missing}} | q) dX_{\text{missing}}$$
 - i.e. just skip dimensions of Gaussian
 - can use 'upper bounds' on spectral values
- **New: 'Data imputation'**
 - use $E[X_{\text{missing}} | X_{\text{present}}, q]$
 - permits cepstra, deltas
- **What about connectionist systems?**
 - also permitted by data imputation
 - or Radial Basis Function neural networks?
(Andy Morris/IDIAP)



Harmonicity labelling for multistream

(Herve Glotin, ICP/IDIAP)

- **‘Pitch pulse’ in envelope autocorrelation is correlated to subband SNR (for vowels)**
- **Use artificial mixtures to train $R_{xx} \rightarrow \text{SNR}$ map**
- **‘Full combination’ multistream needs weights:**
 - $p(q | a,b,c,d) = \sum_S p(S) \cdot p(q | S,a,b,c,d)$
 S ranges over 16 possible combinations
 - uniform weighting is worse than best single S
 - $p(S) = p(\text{SNR} > \theta)$ gives best result:
NB-noise-Num95: 15%FB \rightarrow 13.3%WMB



Multistream vs. alternatives

(Andy Morris)

- **Keep an eye on alternative techniques**
 - e.g. noise robustness through spectral subtraction, microphone techniques
- **Techniques may not combine additively**
 - e.g. log Rasta vs. j-Rasta for full/multi-band:

